



Minisymposium 19 - Random Discrete Structures and Algorithms

Dependent Randomized Rounding

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A very successful approach to rounding problems is the one of *randomized rounding* introduced by Raghavan and Thompson (1987). Here, if $x \in [0, 1]^n$, its (independent) randomized rounding y satisfies $\Pr(y_j = 1) = x_j$ and $\Pr(y_j = 0) = 1 - x_j$ independently for all $j \in [n]$. Rounding independently allows to use large deviation bounds for sums of independent random variables, which makes this a powerful method in algorithmics.

A recent development in this field are dependent approaches. Of particular interest are randomized roundings that satisfy certain cardinality constraints (sums of some variables remain unchanged). In addition to satisfying such constraints we still want the roundings to be independent enough to admit large deviation bounds.

In the talk, I will present a fairly general approach to such problems. It provides simpler and faster solutions to such rounding problems regarded in the past and has new applications that could not be solved with the earlier approaches.